

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 28 NOV 2005
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Applicant's or agent's file reference 27042	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/IL04/00091	International filing date (day/month/year) 29 January 2004 (29.01.2004)	Priority date (day/month/year) 29 January 2003 (29.01.2003)
International Patent Classification (IPC) or national classification and IPC IPC(7): H04B 10/04, 10/12 and US Cl.: 398/200,201		
Applicant YISSUM RESEARCH DEVELOPMENT COMP. OF THE HEBREW U		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:

- a. ☐ (sent to the applicant and to the International Bureau) a total of ___ sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
- b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand 17 June 2004 (17.06.2004)	Date of completion of this report 29 September 2005 (29.09.2005)
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Jason Chan <i>Remair</i> Telephone No. 571 272-2600

Form PCT/IPEA/409 (cover sheet)(April 2005)

Box No. I Basis of the report

1. With regard to the language, this report is based on:

- ☐ the international application in the language in which it was filed.
- ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4(a))
- ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- ☒ the international application as originally filed/furnished
- ☒ the description:
pages 1-28 as originally filed/furnished
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____
- ☒ the claims:
pages 29-36 as originally filed/furnished
pages* NONE as amended (together with any statement) under Article 19
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____
- ☒ the drawings:
pages 1-14 as originally filed/furnished
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims <u>1-43</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>13-39,42</u>	YES
	Claims <u>1-12,40-41,43</u>	NO
Industrial Applicability (IA)	Claims <u>1-43</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and Explanations (Rule 70.7)

Claims 1-4, 7 and 10-11 lack an inventive step under PCT Article 33(3) as being obvious over Anderson (U.S. Patent 5,999,291) in view of Pezeshki et al. (U.S. Patent Application Pub. 2002/0085594 A1). Regarding claim 1, Anderson teaches in FIG. 1 a laser power grid comprising a plurality of lasers 100 and splitters 150 and 154 for distributing the optical light. The difference between Anderson and the claimed invention is that Anderson does not teach a plurality of optical-switch arrays. Pezeshki et al. teaches in FIG. 2 to use a optical-switch array to select a wavelength out of a plurality of wavelengths. It is obvious to apply the teaching of Pezeshki et al. to the laser power grid of Anderson for a plurality of WDM systems to share a central light source and use a plurality of optical-switch arrays, one for each WDM system, to select appropriate wavelength(s) for use. Regarding claim 2, Anderson teaches a plurality of optical fibers. Regarding claims 3 and 4, the use of multi-mode and single-mode fibers are well known in the art. Regarding claim 7, Pezeshki et al. teaches in FIG. 2 to use same number of switches as number of lasers. Regarding claim 10, Pezeshki et al. teaches to deflect single light propagation. Regarding claim 11, Anderson teaches laser sources of fixed-wavelength.

Claims 5-6 lack an inventive step under PCT Article 33(3) as being obvious over the prior art as applied in the immediately preceding paragraph and further in view of Agranat et al. (PCT WO 00/02098). Anderson and Pezeshki et al. have been discussed in regard to claims 1-4, 7 and 10-11. Agranat et al. further teaches in FIG. 1 a electro-holographic optical switch operated by applying electric field.

Claims 8-9 and 43 lack an inventive step under PCT Article 33(3) as being obvious over the prior art as applied in the preceding paragraph for claims 1-4, 7 and 10-11 and further in view of Kim et al. (U.S. Patent Application Pub. 2002/0159688 A1). Anderson and Pezeshki et al. have been discussed in regard to claims 1-4, 7 and 10-11. Regarding claims 8-9, Kim et al. teaches in FIG. 10 to use demultiplexer 102, optical-switch array 104 and multiplexer 103 to select wavelength(s) from a WDM system. It is obvious to replace the multiplexer 103 with a coupler. Regarding claim 43, Kim et al. teaches deflecting a plurality of wavelengths.

Claim 12 lacks an inventive step under PCT Article 33(3) as being obvious over the prior art as applied in the preceding paragraph for claims 1-4, 7 and 10-11 and further in view of Thomas (U.S. Patent 6,501,866 B2). Anderson and Pezeshki et al. have been discussed in regard to claims 1-4, 7 and 10-11. Regarding claim 12, Thomas teaches in FIG. 6 a power grid using tunable CW lasers 602. It is obvious to replace the laser power grid of Anderson with the laser power grid of Thomas.

Claims 40-41 lack an inventive step under PCT Article 33(3) as being obvious over Lahat et al. (U.S. Patent 6,141,126) in view of Deri et al. (U.S. Patent 6,411,418 B1). Regarding claim 40 Lahat et al. teaches in FIG. 1 a wavelength routing network. A plurality of tunable transmitters 12 send packets to receivers using wavelength as address. It is understood that transmitter #1 and receiver #1 are co-located to form a transceiver or PE. Similarly, transmitter #2 is associated with receiver #2, etc. The difference between Lahat et al. is that each transmitter only has 1 output optical fiber. Deri et al. teaches in FIG. 2 a tunable, or wavelength-selectable transmitter. Since wavelengths are used as addresses, the number of receivers N corresponding to the number of wavelengths generated by the wavelength-selectable transmitter. That is, there are N lasers in each wavelength-selectable transmitter with N fibers connected to the star coupler 18 of FIG. 1 of Lahat et al. Regarding claim 41, the modified star coupler 18 of FIG. 1 of Lahat et al. now has N^2 input and one output. This can be implemented with N^2 couplers.